4.2.4.5 Geology and Soils

Construction and operation of the alternatives at Pantex would have no impact on the geologic resources. A low seismic risk exists, but it would be considered in the design of the proposed alternatives. The existing seismic risk does not preclude the safe construction and operation of the proposed alternative facilities. The facilities would be designed for earthquake-generated ground acceleration in accordance with DOE O 420.1, *Facility Safety*. Because there are no known capable faults at Pantex, the potential for ground rupture as a result of an earthquake during the life of the facility is minimal; ground shaking is more likely. Intensities of more than IV on the MMI scale are not likely at Pantex. Ground shaking could affect the integrity of inadequately designed or nonreinforced structures but would not affect newly designed facilities. Human health effects from accidents initiated by natural phenomena (for example, earthquakes) are discussed in Section 4.2.4.9. Volcanic activity is not anticipated to affect the construction and operation of the alternatives. It is also unlikely that landslides or other nontectonic events would affect the proposed alternatives. Salt dissolution is an active process in the southern High Plains area. However, no surficial expression of sinkholes or fractures associated with salt dissolution have been identified in Carson County. Potential effects due to subsidence, are negligible because salt dissolution is a slow process relative to human activities. Properties and conditions of soils underlying Pantex typically have no limitations on construction with the exception of moderate to severe shrink-swell potential in nearly all areas of Pantex. This factor would be considered in facility design and site preparation. No economically viable geologic resources are known to be present at Pantex.

Impacts to the geologic and soil resource occur during, or as a result of, ground-disturbing construction activities. Construction of the alternatives may involve ground-disturbing activities which could impact the soil resources. The amount of land disturbed is specified below for each alternative. Impacts would depend on the specific soil units in the disturbed area, the extent of land disturbing activities, and the amount of soil disturbed. Within Pantex, the soil erosion potential is directly related to the amount of land disturbed because soil and climatic conditions are similar throughout the site. Control measures would be employed to minimize soil erosion.

[Text deleted.]

No Action Alternative

[Text deleted.] Under the No Action Alternative, DOE would continue current and ongoing activities at Pantex. There would be no ground-disturbing activities beyond those associated with existing and future site improvements. Because no new construction and the associated ground disturbance for potential soil erosion would occur, the No Action Alternative would have no effect on the geologic or soil resources at the site.

Upgrade Alternative

Preferred Alternative: Upgrade With Rocky Flats Environmental Technology Site Plutonium Pits Subalternative

Modify Existing Zone 12 South Facilities for Continued Plutonium Storage

No apparent direct or indirect effects on the geologic resource are anticipated, because neither facility construction and operational activities nor site infrastructure improvements will limit access to potential geologic resources.

Construction activities will occur completely on previously disturbed land, as described in Section 4.2.4.1. The soil disturbance during construction activities would be approximately 0.18 ha (0.45 acres). Soil disturbance would occur primarily from ground-disturbing construction activities (foundation preparation) and activities associated with building construction laydown areas that can expose the soil profile and lead to a possible

increase in soil erosion as a result of wind and water action. Soil loss would depend on the frequency and severity of rain, wind velocities (increases in wind velocity and duration increase potential soil erosion), and the size, location, and duration of ground-breaking activities.

Net soil disturbance during operations would be considerably less than during construction because areas temporarily used for construction laydown would be restored. Although stormwater runoff and wind action could occur during operations, they are anticipated to be minimal.

Upgrade Without Rocky Flats Environmental Technology Site Plutonium or Los Alamos National Laboratory Plutonium Subalternative

Modify Existing Zone 12 South Facilities for Continued Plutonium Storage

The Upgrade Without RFETS Pu or LANL Pu Subalternative is similar to the Upgrade With RFETS Pu Pits Subalternative because the modified facilities in Zone 12 South would be designed with adequate capacity to store all of the RFETS Pu pits. No additional resources would be required and therefore the impacts would be the same.

Upgrade With All or Some Rocky Flats Environmental Technology Site Plutonium and Los Alamos National Laboratory Plutonium Subalternative

Modify Existing Zone 12 South Facilities for Continued Plutonium Storage

Construction and operation effects on geological and soil resources would be the same as those described for the Upgrade With RFETS Pu Pits Subalternative. The soil disturbance during construction activities would be approximately 0.18 ha (0.45 acres) and would occur completely on previously disturbed land. This disturbance would affect the soil profile and lead to a possible temporary increase in erosion as a result of stormwater runoff and wind action. Soil impacts during operation are expected to be minimal. An analysis of the operational effects on the soil resource is provided in the Upgrade With RFETS Pu Pits Subalternative.

Consolidation Alternative

Construct New and Modify Existing Zone 12 South Facilities

No apparent direct or indirect effects on the geologic resource are anticipated because neither facility construction and operational activities nor site infrastructure improvements will restrict access to potential geologic resources.

[Text deleted.] Construction of the storage facilities would occur on previously disturbed land as described in Section 4.2.4.1. However, under this alternative additional soil impacts are anticipated because it has greater construction and operating land use requirements. Approximately 60.5 ha (149 acres) would be disturbed for construction of the Consolidation Alternative. This disturbance would affect the soil profile and lead to a possible temporary increase in erosion as a result of stormwater runoff and wind action. Analysis of operational effects in this section is the same as that provided for the Upgrade Alternative.

Construct New Plutonium Storage Facility

[Text deleted.] Construction of the storage facility would occur on previously disturbed land as described in Section 4.2.4.1. Approximately 58.5 ha (144 acres) of land would be disturbed for the new facility, affecting the soil profile and leading to a possible temporary increase in erosion as a result of stormwater runoff and wind action. [Text deleted.]

Collocation Alternative

Construct New Plutonium and Highly Enriched Uranium Storage Facilities

No apparent direct or indirect effects on the geologic resource are anticipated, because neither facility construction and operational activities nor site infrastructure improvements will restrict access to potential geologic resources.

Construction and operation effects on geology and soil resources for the Collocation Alternative would be similar to those described for the Consolidation Alternative. However, additional soil impacts would be expected from the construction of the storage facilities that will occur completely on previously disturbed land. During construction, approximately 89.5 ha (221 acres) would be required for the new facilities, affecting the soil profile and leading to a possible temporary increase in erosion as a result of stormwater runoff and wind action. Soil impacts during operation are expected to be minimal.

Subalternative Not Including Strategic Reserve and Weapons Research and Development Materials

Exclusion of strategic reserve and weapons R&D materials would give almost the same effects to the geological and soil resources for the No Action Alternative, the Upgrade Alternative, the Consolidation Alternative, and the Collocation Alternative. By excluding these materials the size of a facility would be similar, thus not changing the amount of land disturbed by construction activities. No effect to the geologic resource is anticipated as a result of this subalternative.

Phaseout

The phaseout of storage capacity would have no apparent effects on the geology and soil resource. However, phaseout could result in beneficial effects on the soils of the area. Hazardous, radioactive, and mixed waste sources would be eliminated from the area, thus decreasing the potential for future soil contamination.

[Text deleted.]